WHAT IS CLAIMED IS:

1. A method for producing 8-nitroguanine, comprising:

   a) obtaining a suspension of guanine in acetonitrile;

   b) obtaining a solution of acetyl nitrate;

   c) adding the acetyl nitrate to the guanine suspension;

   d) reacting the acetyl nitrate with the guanine to form 8-nitroguanine; and

   e) collecting the 8-nitroguanine.

2. The method of claim 1, wherein the acetyl nitrate is obtained by a process comprising, (i) cooling acetic anhydride on ice; and (ii) adding concentrated nitric acid to the acetic anhydride to form acetyl nitrate.

3. The method of claim 1, wherein the reacting step comprises refluxing for about 4 hours.

4. The method of claim 1, wherein the collecting step comprises centifugation of a precipitate containing 8-nitroguanine.

5. A method for producing 8-nitroguanine, comprising:

   a) obtaining a suspension of guanine in acetonitrile;

   b) adding nitronium tetrafluoroborate to the guanine suspension;

   c) reacting the nitronium tetrafluoroborate with the guanine to form 8-nitroguanine; and

   d) collecting the 8-nitroguanine.

6. The method of claim 5, wherein the collecting step comprises centifugation of a precipitate containing 8-nitroguanine.

7. The method of claim 6, wherein the collected precipitate is washed to remove remaining nitronium tetrafluoroborate.

8. A method for producing 8-nitroguanine, comprising:

a) obtaining a suspension of guanine in trifluoroacetic anhydride;

b) adding concentrated nitric acid to the guanine suspension to form trifluoroacetyl nitrate;

c) reacting the trifluoroacetyl nitrate with the guanine to form 8-nitroguanine; and

d) collecting the 8-nitroguanine.

9. The method of claim 8, wherein the reacting step comprises stirring overnight at room temperature.

10. The method of claim 8, wherein the collecting step comprises centrifugation of a precipitate containing 8-nitroguanine.

11. The method of claim 10, further comprising: (i) washing the collected precipitate with buffer at a pH of about 7.0; and (ii) washing the collected precipitate with water to remove the buffer.

12. A method for producing 8-nitroguanine, comprising:

a) obtaining a suspension of guanine in water or dimethylformamide;

b) adding sodium nitrite to the guanine suspension;

c) reacting the sodium nitrite with the guanine to form 8-nitroguanine; and

d) collecting the 8-nitroguanine.

13. A method for producing 8-nitroguanine, comprising:

a) obtaining a suspension of guanine in nitromethane;

b) adding nitronium tetrafluoroborate to the guanine suspension;

c) reacting the nitronium tetrafluoroborate with the guanine to form 8-nitroguanine; and

d) collecting the 8-nitroguanine.

14. A composition comprising 8-nitroguanine, produced by the method of claims 1, 5, 8, 12 or 13.

15. A method of use of 8-nitroguanine, comprising:

a) obtaining a composition comprising 8-nitroguanine, wherein the composition is produced by the method of claims 1, 5, 8, 12 or 13; and

b) using the 8-nitroguanine as a standard for detection of 8-nitroguanine in a sample.

16. A method of predicting organ rejection in a transplant recipient comprising:

a) collecting one or more samples from said recipient; and

b) detecting 8-nitroguanine in said one or more samples;

wherein the presence of 8-nitroguanine is predictive of organ rejection.

17. The method of claim 16, wherein said sample is a urine sample, a blood sample or a biopsy sample.

18. The method of claim 16, wherein said detecting step comprises HPLC, mass-spectroscopy, gas chromatography, nuclear magnetic resonance, capillary electrophoresis or electrochemical detection.

19. A method of detecting stress in an organism comprising:

a) collecting one or more samples from said organism; and

b) detecting 8-nitroguanine in said one or more samples;

wherein the presence of 8-nitroguanine is indicative of stress.

20. The method of claim 19, wherein the stress comprises exposure to ionizing radiation, toxic chemicals or infectious agents.

21. The method of claim 20, wherein said sample is a blood sample, a urine sample or a biopsy sample.